FINAL - Meeting Summary Notes
Lewis River License Implementation
Merwin Trap Engineering Subgroup
February 7, 2006
Merwin Hydro Facility, Ariel, WA

Subgroup Participants Present: (9)

Frank Shrier, PacifiCorp
Sean Flak, PacifiCorp
Arnold Adams, PacifiCorp
Eric Kinne, WDFW
Curt Leigh, WDFW (via phone)
Pat Klavas, WDFW
Bryan Nordlund, NOAA Fisheries
Monty Nigus, Black & Veatch
Dana Postlewait, R2 Resource Consultants

Handouts (Distributed at the meeting):

- o Agenda.
- o Draft Meeting Summary Notes for November 15, 2005, Engineering Subgroup Meeting.
- o Facility Design Criteria Document Rev 2 (dated January 30, 2006).
- o Technical Memorandum Addendum #1. Merwin Trap, Fish Sorting Facility Design, Sorting Tank Sizing Calculations (dated February 6, 2006).
- o Copy of SA 4.2.c. Merwin Trap Upgrades letter to NOAA, USFWS, and WDFW (dated February 1, 2006).
- Drawing PD-53153 showing Fish Trap Alarm System Control Description and Trap Safety Improvement features.
- o Preliminary Merwin Trap Statistics handout, for Winter Steelhead, Summer Steelhead, and Coho.

ADMINISTRATIVE

Welcome of attendees and review agenda.

Introductions: Pat Klavas introduced himself as WDFW's project engineer, who will support Curt Leigh and Erik Kinne for the Merwin upstream passage project (trap and sorting facility project).

FERC License Schedule Update: Frank Shrier provided a license schedule update. The "issuance of license" date is still anticipated sometime in June, 2006. The ACC is working with WDOE to finalize plans for the flow regime in the bypass reach, and WDOE is expected to draft a Water Quality (401) Certificate by February 10th, which will then require a 30 day public

review then final processing. USFWS and NOAA are also working on their BIOP's, which are expected to be completed before the WDOE 401 certification process.

Review of Last Meeting's Action Items: See status summary table below. Additional discussion is provided below the table.

Report on Previous Assignments (from Aug 30 th and Nov 15 th Mtgs):	Status:
PacifiCorp (Shrier): Follow-up with Ed Weiss regarding his emailed	Complete – See Item
comments regarding why two of the trap entrances were closed –	1 below.
specifically, what did he mean with the statement "some of the fallout of	
the design of Merwin Hatchery also affected the decision".	
Subgroup (Kinne, Nordlund, Leigh, Shrier): provide one last critical review	Complete – See Item
of the final "Facility Design Criteria" document. Desire is to finalize this	2 below.
document and recommend it for approval to the ACC. Please email	
comments to Kim McCune, with a cc to Dana Postlewait.	
Will Shallenberger will send Curt Leigh a .pdf copy of the current upper	Complete.
release site preliminary drawings. These do not need to include comments to	
be incorporated in the future.	
PacifiCorp (Frank Shrier) will report to the ACC that the Engineering	Completed at the
Subgroup agrees with the facility location and design concept for the Upper	February 9 th ACC
Release Project. Additional details will be developed and comments	meeting.
discussed at the meeting will be incorporated during permitting and final	
design phases.	
Criteria Document. Dana will make changes discussed at the meeting and	Complete – See Item
distribute a new version via Kim McCune pending approval of document	2 below.
with noted revisions.	
Eric Kinne will review the draft proposed fish trap safety interim measures	Complete – See
and get back to Sean Flak with WDFW's comments.	agenda item notes.
Sean Flak will test the time available to evacuate the fish trap chamber with	Complete – See
the current high flows of about 8,800 cfs.	agenda item notes.
Subgroup (Nordlund, Leigh, Kinne). Review the Siting Study Summary and	Complete – See
provide concurrence with recommendations for Options 1A, and/or other	agenda item notes.
comments.	
Will Shallenberger will provide an update on PMF needs and preliminary	Pending – See Item
alternatives to address them at the next meeting.	3 below.

Additional Comments on Last Meeting's Action List:

1. Frank reported on his follow-up with Ed Weiss regarding the "fallout" comment related to the fish trap. Ed clarified that he was only referring to the coordination issues between the old WDFW organization that divided the department between the Department of Wildlife, and Department of Fisheries. There were disagreements between the two departments on the hatchery planning and design, which occurred as the two agencies were merging. This comment was unrelated to the trap closure issue, and not relevant to this issue.

Ed Weiss reported that the original two of three trap entrances were closed based on

hydraulic concerns, and damaging surging/sloshing of water and debris within the trap entrances and channel during high flows, and especially during spill events. At about 18,000 cfs of spill, the tailwater can spill over the top of the existing fyke arrangements, and debris can enter the fish channel. At these turbulent flows, debris (sticks, logs, etc.), was impacting the wood channel liner and causing damage, including causing injury to fish. The decision was made based on both fish injury and operations and maintenance concerns that it would be better to close the two entrances. This issue will need to be addressed with the updated design.

Note also that the proposed upper fish passage design flow based on the 5% exceedance flow will need to be examined for proper trap entrance operation, and that the ability to close off the trap entrance to avoid damaging surges and debris issues should be examined. Related to this issue, the tailwater rating curve was checked by Monty Nigus, Sean Flak, and Dana Postlewait during the last site visit, and a calibration factor between the existing tailwater rating curve and the deck elevation will be developed during the design phase to confirm we are designing to the proper level.

- 2. The subgroup discussed the changes made following the November 15th meeting to the Criteria Document. All of the changes made and distributed prior to and at the February 7th meeting were agreed to, except for the Fish Process Flow Diagrams in Attachment A. It was agreed at this meeting to delete the "optional" visual sorting flume from these process flow diagrams, as the visual sorting flume is not desired for this program. These changes were made on February 8th, and the document finalized for presentation to the ACC which occurred on February 9th. PacifiCorp has posted the Draft document on their license implementation website, and the ACC is reviewing the document prior to final acceptance.
- 3. Will Shallenberger did not attend this meeting. Monty Nigus provided a brief status update related to the Swift PMF and Downstream Passage Project. Black & Veatch / R2 have completed a preliminary alternatives analysis related to the PMF and downstream fish passage system at Swift, and have submitted a draft technical memorandum to PacifiCorp for review. PacifiCorp is reviewing the document, and is gearing up to begin work with the engineering subgroup on the downstream passage system design. This effort should begin in the next couple months, at which time a formal project brief, work plan, and schedule will be provided to begin formal consultation with the Agencies.

Comments and Finalization of November 15th Meeting Notes: The November 15th meeting record can be finalized with the addition of one edit as follows.

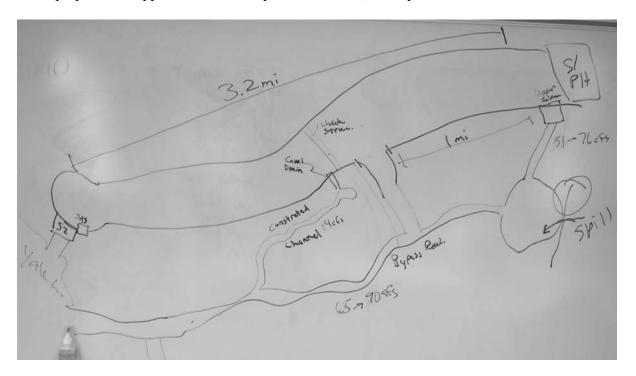
Page 4 – last paragraph above heading "Finalization of August 30th Meeting Notes, and Protocol for Meeting Notes". 1. Add the following sentence: "Specifically, Bryan noted that it will be important to have an understanding of how fish approach the intake and spillways (via fish behavior studies) for the fish passage design flows, in order to evaluate where best to locate the downstream fish collection facilities." The group discussed the importance of using biological data to help design the PMF and fish collection facilities at Swift. It was agreed that the PMF design is less dependent on fish studies, as any PMF flows are well beyond the target fish

passage design flows. However, biological fish behavior studies will be very valuable for the fish collection and bypass system.

Bryan also provided input on the Merwin Fish Tracking Study section relating to proposed fish performance standards, and asked that we provide more information as to the number of fish tested in addition to the percentage numbers reported. These comments and additional preliminary study data are documented in these meeting notes, and do not need to be added to the November 15th notes.

SWIFT CANAL UPPER FLOW RELEASE PROJECT

Monty Nigus and Frank Shrier presented an update of the Upper Flow Release project. As Pat Klavas is new to the project, Frank also provided a sketch and overview of the entire bypass reach project. A copy of the sketch is provided below, to help facilitate the discussion.



As reported last month, the design flows for the project are being developed by WDOE. The SA states that the ACC shall define the flow regime between the Canal Drain and the new Upper Release Site. The SA also defines 55,000 acre-feet as the basis for the flow to be released from the canal. Flows will be variable depending on the season, and total project flows. At this time, it appears that the flows defined in Table 1 are being considered by WDOE. Additional flow information will be provided to the engineering subgroup and the design team following ACC review and adoption. Note that the values in Table 1 are preliminary only, and are subject to change. Bryan Nordlund also pointed out that while typically fish structures are designed to accommodate the 5%/95% exceedance flows, that for this structure it would be more appropriate to design the release structure for the expected flow range during normal release flows.

Table 1: Current Anticipated Flows for the Bypass Reach (for planning only)

Total Flow	Canal Drain Contribution	Upper Release Structure Contribution
(cfs)	(cfs)	(cfs)
90	14	76
75	14	61
65	14	51

In addition to the planned release flows, there is some seepage into the bypass reach area. Approximately 21 cfs is believed to seep into the bypass reach. Ole Creek also contributes flow near the bypass reach's confluence with Yale lake.

Other flow and operational data discussed at the meeting includes:

- The existing canal drain has a capacity of 47 cfs, and spills over a rock spillway about 6' to 8' high. This release mechanism would be used at its full capacity to release flows while the new upper release structure is constructed.
- The overflow weir (immediately upstream of the check structure) operates an average of 6 times per year. This weir and spillway can accommodate the full Swift No. 2 flow, and was used during the Swift No. 2 powerhouse and canal rebuild project.
- Ocowlitz PUD added a Surge Arresting Structure (SAS) to the new powerhouse design, shown on the above sketch. This feature can open within 30 seconds of a load rejection and will attenuate a surge wave that could occur during load rejection. This feature has a hydraulic capacity of 4,500 cfs.

Fisheries goals for this project area include a put-and-take rainbow trout fishery in the Swift No. 2 Power Canal, and gravel placement for both the constructed channel and the channel below the upper release structure.

The design details of the new upper release structure will be dependent on the final design flows recommended by the ACC, and may be influenced by spawning area requirements downstream of the facility. A general plan of the proposed release structure was distributed at the last meeting. Bryan Nordlund provided comments related to specific design details of the structure, which the design team has been and will continue to incorporate into the next iteration of the design. Because the design flows will influence the final upper release structure facility design, no additional detail was presented at this meeting. The schedule for this project calls for construction to begin within six months of the Issuance of License date. Given that this period may not correspond with the low-flow in-water work period desired for the construction, it may be necessary to construct the facility during the first available low-flow period following approval of design.

The subgroup agrees with the general intent and approach to the upper release structure design, and will provide more input once the design flows are known. The next step will be to prepare permit drawings for construction as soon as the design flows are defined and the spawning area requirements downstream of the facility are confirmed.

FACILITY DESIGN CRITERIA. SA 4.2 MERWIN TRAP, AND SA 4.3 MERWIN UPSTREAM COLLECTION & TRANSPORT FACILITY.

Dana Postlewait reviewed the updates made to the Design Criteria Document, including:

- o Modifying Table 1 to make corrections noted during the November 15, 2005 meeting, and providing additional run timing data for the hatchery brood take.
- o Updating the fish process flow diagram charts as discussed at the November 15 meeting.

In reviewing the fish process flow diagrams, the subgroup reached consensus to remove the visual sorting flume from the process. All of the other changes were accepted, so once the diagrams are updated this document is ready for distribution to the ACC.

Follow-up: The sorting document changes were made on February 8th, and the Criteria Document was distributed to the ACC on February 9th by Frank Shrier. This document is now posted on PacifiCorp's Lewis River License Implementation web site.

TECHNICAL MEMORANDUM – ADDENDUM #1: MERWIN TRAP, FISH SORTING FACILTY DESIGN, SORTING TANK SIZING CALCUATIONS

Dana summarized updates made to the Technical Memorandum since the previous meeting, and handed out new copies of an Addendum #1 document dated February 6, 2005. No comments were received during the review period on the November 7th Technical Memorandum. Because this is an internal work product intended to produce the final tank loading plan (Attachment 14 to the memo), the original Technical Memo was not revised.

Dana reviewed changes made to Attachments 3, 5, 10, and 12, which were all intermediate products leading to the tank loading plan and facility capacity sheets in Attachment 14. He then worked through the updated Attachment 14, which was significantly expanded from the November 15 draft to include:

- o Tank loading plans for all tanks, including:
 - 4-3,000 gallon large tanks.
 - 6-150 gallon (or more) small tanks
 - One 400 gallon fish trailer
- o Tank loading plans for all 12 months.

The analysis showed that the loading plan could be changed to utilize only 4 small tanks, plus the 4 large tanks and the fish trailer. This attachment has a lot of information, and provides a detailed analysis. Erik Kinne and WDFW will confirm this analysis, and review the draft tank loading plan carefully. If their review confirms that only 4 small tanks are needed, R2 / Black & Veatch will rework a final tank loading plan for the next meeting, and will increase the capacity of the four small tanks to the maximum weight allowable on a dual-axle fish trailer. A capacity of 200 to 250 gallons is anticipated.

Once the final plan is agreed to, a proposed Tank Loading Plan (updated Attachment 14) will be recommended to the ACC for approval. Issuance of the entire Technical Memorandum is not warranted as this is primarily a calculation package. The subgroup agreed that a brief

recommendation memo, stating the number of tanks, their size, and the tank loading plan would be more appropriate for distribution to the ACC.

FISH TRAP SAFETY IMPROVEMENTS

Sean Flak reviewed the additional work performed to date on the fish trap safety improvement project (including testing at 10,000 cfs), and handed out a letter dated February 1st from Frank Shrier to NOAA, USFWS, and WDFW describing PacifiCorp's proposed measures for the trap safety upgrades, and continued flow restrictions. Sean also handed out a drawing (30% design level) showing the proposed measures, including:

- o Installation of submersible lighting in the fishway, and near the bottom of the fish lift. Lights will have manual on/off switch.
- Installation of audible and visible alarms such as sirens and strobe lights to alert workers
 when to vacate the fish trap after a pump failure. An alarm on/off switch will be
 provided near the trap access point.
- o Installation of hand rails above the high water level to assist workers when vacating the fish trap (two rails are proposed at two heights). Handrails will be designed to be smooth to prevent fish injury, and with adequate spacing between supports and the wall to prevent gilling of any fish.
- Limit plant discharge flows to 5,500 cfs when conducting the in-trap activities to maintain the tailrace at a level that provides acceptable headspace in the fish trap if there is a pump failure.
- o Requirement that trap workers continue to wear life vests while in the trap.
- Addition of an actuator for the hatchery water supply line on the bridge, with the actuator proposed to be near the valve on the bridge. WDFW suggested putting the actuator closer to the trap. This suggestion will be taken into consideration during the design process, but no decision was made at the meeting.

PacifiCorp noted that they plan to submit the 30% design drawing to the ACC in the next couple weeks.

Sean noted that PacifiCorp reviewed operational records related to limiting the plant discharge flows to 5,500 cfs. This restriction would likely limit the operation of the trap an average of 40 days per year. Flow restrictions will begin February 15th.

Other topics discussed included the idea to perform fish collection at the Lewis River Salmon Hatchery during Merwin Trap temporary shutdowns proposed until the new trap facility is constructed. If it is known that fish have entered the Merwin Trap prior to its shutdown for high flows, it would be possible during most flow conditions to temporarily reduce project flows so personnel could safely enter the trap to collect these fish. At flows less than 8,000 cfs, flows could be ramped down and fish collected within about 8 hours.

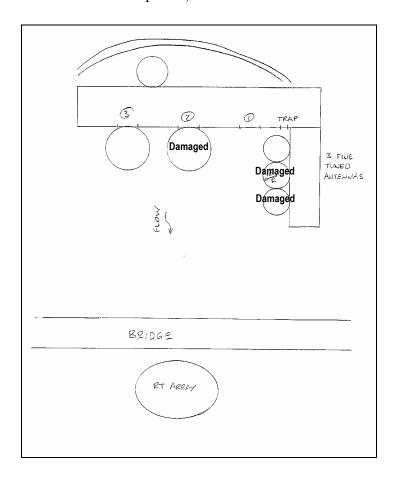
Eric Kinne and Sean Flak will coordinate on these efforts. Sean also indicated that PacifiCorp will examine the loading capacity of the existing personnel ladders in the trap, and that the fish trap safety improvements design will proceed to the 60% design level.

MERWIN FISH TRACKING STUDY

Frank Shrier presented an update of the tracking studies currently underway, and handed out a preliminary data sheet with Merwin Trap Statistics. This is an interim, preliminary work product, and additional information will be provided at the next meeting.

The radio tag study is currently in the Winter Steelhead phase. A group of fish were tagged last week and released.

High flows during the recent heavy rain period damaged three of the radio tracking antennas, which are currently not operational (see sketch below). These will be repaired as soon as flows decrease enough for personnel to safely perform the necessary repairs. However, the other antennas are still functioning well, and are able to track fish during the study. (Follow-up: as of February 15th, the antennas have been repaired).



Frank gave at thorough review of the trap statistics handout, and study methods used to evaluate the data. The group had numerous questions and a good discussion, and provided Frank with input to address in the data analysis and final reporting. Because this was preliminary data, this discussion is not outlined in detail in these notes, but will be addressed with distribution of the data analysis report in the future. Following completion of the winter steelhead study, spring Chinook will be tagged and released in mid-May and early-June, and then a draft report will be released most likely in July.

TRAP CAPTURE EFFICIENCY CONSIDERATIONS

A discussion regarding the work underway to establish a protocol to address and quantify the trap capture efficiency was held during review of the action items, and was continued following the fish tracking study discussion. As discussed at the last meeting, Frank Shrier confirmed that the team has abandoned the use of hydroacoustics as a means to determine trap capture efficiency. Currently, he envisions using radio tag studies with a capture/release protocol of subgroups of fish. Frank is developing a draft report due to the ACC by the end of March that will provide additional recommendations on how to best evaluate the trap capture efficiency. This report will have data for steelhead and coho, but not for spring Chinook but will actually not be issued until July to incorporate the Spring Chinook data.

One goal of this analysis is to use the existing data collected to date to establish a capture efficiency of the existing trap. Another goal to consider is to establish a protocol for trap performance in order to monitor conditions of the future trap improvements. The other goal is to use the existing fish tracking and monitoring studies to help design the improved trap details.

Bryan Nordlund noted that he's been discussing fish trap monitoring needs with Michelle Day. One idea of how to establish performance goals would be to monitor when fish enter the tailrace area, and when they actually enter the trap. For example, a goal could be set such as: "desire 50% of the fish that arrive in a tailrace enter the trap within 24 hours, and all fish enter the trap within 72 hours of their arrival in the tailrace".

Bryan noted that it's difficult to compare these types of performance standards with other projects, as they are all very site specific and have varying types of monitoring systems/equipment. Data generally shows that fish pass the Columbia River dams within 24 hours of their detection in the tailrace. Other sites are less clear, and the statistical measure varies depending on the technology used. Use of the radio tag antenna downstream of the bridge could be an indicator of fish arrival at the tailrace, and daily fish counts in the trap may be sufficient for the passage rate.

The group understands that this is a difficult issue to address at this site, and the team will continue working on how best to address the trap performance monitoring needs. Additional information on the trap performance discussions are provided in the Sorting Facility Siting Study section, under the "Fish Entrance Options" heading.

SORTING FACILITY SITING STUDY

The group had an action item following the last meeting to comment on PacifiCorp's recommended site location of Option 1A, as presented in the Siting Study Summary report distributed at the November 15, 2005 meeting.

Concerns discussed by the group related to the preferred site include:

- 1) the potential for limited access across the bridge during high spill events, as the bridge is typically closed to travel due to high winds and spray during flow events;
- 2) want to keep options open for a different fish trap entrance if the trap efficiency isn't high enough to support the re-introduction program; and

3) PacifiCorp wants to better understand the potential traffic loads for the facility to assure its use doesn't impact current project operations.

These issues are discussed below.

Bridge Access:

The bridge access concern does not appear to be an insurmountable issue. PacifiCorp will verify at what flows the bridge is shutdown for spill flows for the next meeting. However, initial indications indicate any closure times would be well beyond the 5% exceedance flow limit to which the trap and sorting facility must be operational. PacifiCorp has also previously examined means to mitigate the water spray across the bridge (such as mist deflectors or walls added to the bridge), so there may be was to address this concern if the shutdown frequency does prove to be an issue.

Fish Entrance Options:

The concern behind the possible need for an additional fishway entrance is related to observations of some fish along the left bank downstream of the existing trap entrance, that have been seen oriented pointing the wrong way under some flow scenarios. Dana Postlewait relayed that a ladder entrance could be provided leading to Site 1A to an area along the left bank near the bridge abutment, or elsewhere along the left bank that could lead to the trap. This location was studied in the Phase 1 Fish Passage Conceptual Design Report, during the relicensing process. Another option to provide an entrance along the left bank would be to provide a guide wall from the existing trap entrance to extend a collection channel downstream. It was acknowledged that the trap monitoring requirements in the SA are intended to assure the settlement team that the trap will be able to operate at a sufficient level to support the re-introduction effort.

If future monitoring indicates that an additional trap entrance or other possible improvements to enhance the proposed fishway entrances along the face of the powerhouse are necessary, the subgroup needs to keep options open, and not allow the site selection to negatively impact these alternatives. The only fishway entrance option that Site 1A would preclude would be the location of a new trap entrance further downstream, such as with a new barrier dam constructed some distance downstream of the bridge. This approach would not be the preferred means to mitigate a poorly operating entrance, as much habitat would be lost should a barrier dam be constructed that would limit fish use of the area near the powerhouse. Given that other options are available (such as adding a new fishway entrance or modifying hydraulic patterns in the tailrace with rock excavation or addition of flow guiding structures), this issue does not preclude the use of Site 1A as desired.

Fish Trap Traffic Projections

Regarding the traffic projections for the fish trap, the new tank loading plan provided in the Tech Memo Addendum #1 provides an estimate for the number of fish truck trips/day. At the peak in September, up to 10 tank trips could be required on a daily basis. These trips would likely be done in a batch manner, with two to three sorting/loading cycles throughout the day. Additionally, one to two trips per day would be necessary to the hatchery with smaller loads, plus the trap facility operational staff trips to the facility each day. This level of traffic does not appear to be a deterrent to this site.

Recommendations for the Sorting Facility Preferred Site

Based on the discussion above, it was agreed that further development can begin on Site 1A, and that updates will be provided to the subgroup at each meeting.

OTHER DISCUSSIONS

Fish Trap Entrance

The need to develop an effective fish trap entrance was discussed at length with the subgroup. Agency representatives stated their preference for the fish monitoring studies to be completed to a level that the data gained from the studies can be used to facilitate the trap design. It was agreed that initial concepts can be developed to improve the existing fishway entrances, and that draft fish behavior data would be made available to the design team as the design progresses. This data will be presented with conceptual design alternatives to the subgroup members as it is developed. The overlying goal is to assure that the trap entrance is not a bottleneck to the fish reintroduction program.

Fish Conveyance Flume

Bryan Nordlund also noted that the velocities in the fish conveyance flume (from the fish lift to the sorting facility) were a bit high. After a group discussion, it was agreed that the criteria used was correct for this unique application, and a high velocity was desirable. Careful attention to the design details will be given to assure appropriate entrance details into the flume, and a proper transition into the pre-sorting pool will be provided to avoid fish injury.

Surplus Station

The desired configuration for the surplus station at the sorting facility was discussed. At this time, fish destined for surplus will be stored in an unused fish holding tank (which will typically be available once the other goals are met) for transport to the hatchery for processing, or will be killed at the sorting station and placed into plastic totes. Truck access desired for the totes includes a minimum large panel truck area, or preferably a semi-truck (18 wheeler) access. Up to 36 totes can fit into a semi truck trailer.

A storage area to hold the totes and at least two pipes leading to a tote loading area will be provided so the sorting process can always function.

Eric Kinne will confirm this approach during his review of the tank loading plan.

NEXT STEPS AND OTHER ITEMS

The next design priorities will be:

- o Develop the fish trap safety improvements to the 60% design level,
- o development of the facility programming and preliminary layout for the sorting facility, and
- development of design concepts for the fish trap entrance improvements at the powerhouse.

NEW ASSIGNMENTS (FROM FEBRUARY 7 TH MEETING):	STATUS:
Design Team (Shallenberger, Nigus): Complete permit drawings for the	Pending
Swift Canal upper release structure - pending flow recommendations from	
WDOE, and further definition of downstream spawning area requirements.	
PacifiCorp (Flak, Shrier): Submit 30% fish trap safety improvements to	Pending
ACC.	
Design Team (Flak, Nigus): Check ladder capacity in fish trap.	Pending
Design Team (Nigus): Complete 60% design for fish trap safety	Pending
improvements.	
Subgroup (Kinne, Nordlund, Leigh, Klavas, Shrier): provide one last critical	Pending
review of Attachment 14 – the Tank Loading Plan. Confirm that 4 small	
tanks are sufficient for the program. Desire is to finalize this document and	
add a summary recommendation memo for presentation to the ACC. Please	
email comments to Kim McCune, with a cc to Dana Postlewait.	
Sean Flak: confirm at what spill flows the bridge is typically closed to access	Pending
the proposed sorting facility site.	
Eric Kinne: confirm surplus station concepts as described above, in	Pending
conjunction with a review of the latest tank loading plan.	

FUTURE MEETING DATES

o The next meeting is scheduled for March 7th at the Merwin Hydro Facility

Meeting was adjourned at about 3:30 pm